

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application. Please amend the claims, as follows:

1. (Currently Amended) A method of replicating data objects from a source system to a target system, the method comprising:

~~creating-providing~~ an electronic data element accessible to at least one software program implementing one or more data-object replication processes and one or more software processes other than the one or more data-object replication processes, the electronic data element having a first data field containing data representing an identifier functioning as a link to one or more data objects and a second data field containing data representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

- a) a first state, in which said electronic data element is accessible by one or more of the software processes other than the data-object replication processes ~~data-object processing-operations~~ and whereby said identifier is assignable to one or more data objects,
- b) a second state, in which said electronic data element is not accessible by one or more of the software processes other than the data-object replication processes ~~data-object-~~

~~processing operations~~ and whereby said identifier is
assignable assigned to one or more data objects, and

c) a third state, in which said electronic data element is not
accessible by one or more of the software processes other
than the data-object replication processes ~~data-object-~~
~~processing operations~~ and whereby said identifier is not
assignable to one or more data objects;

setting the state of the identifier to the first state;

setting a shared lock on the electronic data element after the state of the
identifier has been set to the first state;

assigning the identifier to one or more data objects stored in a memory of the
source system;

processing, by one or more of the software processes other than the data-object
replication processes, ~~data-object-processing operations~~, the one or more
data objects assigned to the identifier while the identifier is set to the first
state;

storing, after processing the one or more data objects, the one or more
processed data objects to the memory of the source system;

removing the shared lock from the electronic data element after the one or more
processed data objects have been committed to storage in the memory of
the source system;

changing, after removing the shared lock from the electronic data element, the
state of the identifier to the third state;

setting an exclusive lock on the electronic data element after changing the state of the identifier to the third state;

replicating, by the one or more data-object replication processes after ~~setting~~ the exclusive lock has been set on the electronic data element, the one or more processed data objects from the memory in the source system to a memory in the target system; and

removing the exclusive lock from the electronic data element after replicating the one or more processed data objects from the source system to the target system.

2. (Previously Presented) The method of claim 1, wherein the first data field and the second data field are located in a table.

3. (Previously Presented) The method of claim 1, wherein the first data field is a data field in a first table and the second data field is a data field in a second table.

4. (Previously Presented) The method of claim 1, wherein the electronic data element is implemented in object orientated programming as an instance of a class.

5. (Previously Presented) The method of claim 1, wherein the electronic data element further comprises a third data field containing data functioning as a flag representative of whether the first data field in the electronic data element contains a default identifier.

6. (Previously Presented) The method of claim 1, wherein during a data object processing operation data stored in the second data field is changed from the first state to the second state.

7. (Previously Presented) The method of claim 1, wherein the identifier stored in the first data field is assigned to a plurality of data objects stored in the memory of the source system.

8. (Previously Presented) The method of claim 1, wherein the identifier state stored in the second data field is changed from one of the first and second states to the third state after the one or more processed data objects have been committed to storage in the memory of the source system.

9. (Previously Presented) The method of claim 1, further comprising:
creating a second electronic data element having:

a fourth data field containing data representing an identifier
functioning as a link to one or more data objects, and

a fifth data field containing data representing a state of the identifier
stored in the fourth data field, wherein the state of the
identifier stored in the fifth data field is set to one of the first,
second, and third states.

10. (Previously Presented) The method of claim 9, wherein the second electronic data element further comprises a sixth data field containing data functioning as a flag representative of whether the fourth data field in the second electronic data element contains a default identifier.

11. (Currently Amended) ~~The method of claim 10, further comprising:~~

A method of replicating data objects from a source system to a target system, the method comprising:
creating an electronic data element having a first data field containing data
representing an identifier functioning as a link to one or more data objects
and a second data field containing data representing a state of the
identifier, wherein the state of the identifier is set to one of the following
states:

- a) a first state, in which said electronic data element is accessible
by one or more data object processing operations and
whereby said identifier is assignable to one or more data
objects,
- b) a second state, in which said electronic data element is not
accessible by one or more data object processing operations
and whereby said identifier is assignable to one or more data
objects, and
- c) a third state, in which said electronic data element is not
accessible by one or more data object processing operations

and whereby said identifier is not assignable to one or more
data objects;

setting the state of the identifier to the first state;

setting a shared lock on the electronic data element after the state of the
identifier has been set to the first state;

assigning the identifier to one or more data objects stored in a memory of the
source system;

processing, by one or more data object processing operations, the one or more
data objects assigned to the identifier while the identifier is set to the first
state;

storing, after processing the one or more data objects, the one or more
processed data objects to the memory of the source system;

removing the shared lock from the electronic data element after the one or more
processed data objects have been committed to storage in the memory of
the source system;

changing, after removing the shared lock from the electronic data element, the
state of the identifier to the third state;

setting an exclusive lock on the electronic data element after changing the state
of the identifier to the third state;

replicating, after setting the exclusive lock on the electronic data element, the
one or more processed data objects from the memory in the source
system to a memory in the target system;

removing the exclusive lock from the electronic data element after replicating the
one or more processed data objects from the source system to the target
system;
creating a second electronic data element having:

a fourth data field containing data representing an identifier
functioning as a link to one or more data objects,
a fifth data field containing data representing a state of the identifier
stored in the fourth data field, wherein the state of the
identifier stored in the fifth data field is set to one of the first,
second, and third states,
a sixth data field containing data functioning as a flag
representative of whether the fourth data field in the second
electronic data element contains a default identifier;

changing the data stored in the sixth data field to indicate that the fourth data
field contains the default identifier; and
changing, during the one or more data object processing operations, the data
stored in the second data field to the second state.

12. (Currently Amended) ~~The method of claim 10, further comprising:~~
A method of replicating data objects from a source system to a target system, the
method comprising:

creating an electronic data element having a first data field containing data
representing an identifier functioning as a link to one or more data objects

and a second data field containing data representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

a) a first state, in which said electronic data element is accessible by one or more data object processing operations and whereby said identifier is assignable to one or more data objects,

b) a second state, in which said electronic data element is not accessible by one or more data object processing operations and whereby said identifier is assignable to one or more data objects, and

c) a third state, in which said electronic data element is not accessible by one or more data object processing operations and whereby said identifier is not assignable to one or more data objects;

setting the state of the identifier to the first state;

setting a shared lock on the electronic data element after the state of the identifier has been set to the first state;

assigning the identifier to one or more data objects stored in a memory of the source system;

processing, by one or more data object processing operations, the one or more data objects assigned to the identifier while the identifier is set to the first state;

storing, after processing the one or more data objects, the one or more
processed data objects to the memory of the source system;
removing the shared lock from the electronic data element after the one or more
processed data objects have been committed to storage in the memory of
the source system;
changing, after removing the shared lock from the electronic data element, the
state of the identifier to the third state;
setting an exclusive lock on the electronic data element after changing the state
of the identifier to the third state;
replicating, after setting the exclusive lock on the electronic data element, the
one or more processed data objects from the memory in the source
system to a memory in the target system;
removing the exclusive lock from the electronic data element after replicating the
one or more processed data objects from the source system to the target
system;
creating a second electronic data element having:
a fourth data field containing data representing an identifier
functioning as a link to one or more data objects,
a fifth data field containing data representing a state of the identifier
stored in the fourth data field, wherein the state of the
identifier stored in the fifth data field is set to one of the first,
second, and third states,

a sixth data field containing data functioning as a flag
representative of whether the fourth data field in the second
electronic data element contains a default identifier;

changing the data stored in the sixth data field to indicate that the fourth data
field contains the default identifier;

determining whether ~~the third data field indicates that~~ the first data field contains
the default identifier; and

changing, in response to determining that ~~the third data field indicates that the~~
first data field contains the default identifier, data stored in the first data
field from data representing the default identifier to data representing an
identifier value other than the default identifier.

13. (Previously Presented) The method of claim 1, further comprising:

preventing the state of the identifier stored in the second data field from
being changed to the third state while the shared lock is set on the
electronic data element.

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Previously Presented) The method of claim 1, wherein the electronic data element is shared locked prior to assignment of the identifier to the one or more data objects.

18. (Canceled)

19. (Previously Presented) The method of claim 1, wherein at least one of the data object processing operations examines the state of the shared lock prior to assignment of the identifier to the one more data objects.

20. (Previously Presented) The method of claim 1, wherein the source and target systems are subsystems within the same computer system.

21. (Previously Presented) The method of claim 1, wherein the identifier of the first data field comprises a globally unique identifier.

22. (Previously Presented) The method of claim 1, wherein the identifier of the first data field comprises a time stamp.

23. (Currently Amended) A data-object replication system, comprising:

a source memory;

a target memory;

a microprocessor coupled to the source and target memories and
programmed to:

~~create-provide~~ an electronic data element accessible to at least one
software program implementing one or more data-object
replication processes and one or more software processes
other than the one or more data-object replication
processes, the electronic data element having a first data
field containing data representing an identifier functioning as
a link to one or more data objects and a second data field
containing data representing a state of the identifier, wherein
the state of the identifier is set to one of the following states:

- a) a first state, in which said electronic data element is
accessible by one or more of the software
processes other than the data-object
replication processes ~~data-object-processing-~~
~~operations-and~~ whereby said identifier is
assignable to one or more data objects,
- b) a second state, in which said electronic data
element is not accessible by one or more of the
software processes other than the data-object
replication processes ~~data-object-processing-~~
~~operations-and~~ whereby said identifier is

~~assignable~~assigned to one or more data
objects, and

c) a third state, in which said electronic data element
is not accessible by one or more of the
software processes other than the data-object
replication processes ~~data-object-processing-~~
~~operations~~ and whereby said identifier is not
assignable to one or more data objects;

set the state of the identifier to the first state;

set a shared lock on the electronic data element after the state of
the identifier has been set to the first state;

assign the identifier to one or more data objects stored in the
source memory;

process, by one or more of the software processes other than the
data-object replication processes, data-object-processing-
~~operations~~, the one or more data objects assigned to the
identifier while the identifier is set to the first state;

store, after processing the one or more data objects, the one or
more processed data objects to the source memory;

remove the shared lock from the electronic data element after the
one or more processed data objects have been committed to
storage in the source memory;

change, after removing the shared lock from the electronic data element, the state of the identifier to the third state;
set an exclusive lock on the electronic data element after changing the state of the identifier to the third state;
replicate, by the one or more data-object replication processes after setting the exclusive lock has been set on the electronic data element, the one or more processed data objects from the source memory to the target memory; and
remove the exclusive lock from the electronic data element after replicating the one or more processed data objects from the source memory to the target memory.

24. (Currently Amended) A system for replicating data objects from a source system to a target system, the system comprising:

a source memory;

a target memory;

a microprocessor coupled to the source and target memories;

means for ~~creating~~ providing an electronic data element accessible to at least one software program implementing one or more data-object replication processes and one or more software processes other than the one or more data-object replication processes, the electronic data element having a first data field containing data representing an identifier functioning as a link to one or more data objects and a second data field containing data

representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

- a) a first state, in which said electronic data element is accessible by one or more of the software processes other than the data-object replication processes ~~data-object processing-operations~~ and whereby said identifier is assignable to one or more data objects,
- b) a second state, in which said electronic data element is not accessible by one or more of the software processes other than the data-object replication processes ~~data-object processing-operations~~ and whereby said identifier is ~~assignable~~ assigned to one or more data objects, and
- c) a third state, in which said electronic data element is not accessible by one or more of the software processes other than the data-object replication processes ~~data-object processing-operations~~ and whereby said identifier is not assignable to one or more data objects;

means for setting the state of the identifier to the first state;

means for setting a shared lock on the electronic data element after the state of the identifier has been set to the first state;

means for assigning the identifier to one or more data objects stored in ~~a memory of the source~~ memory; system;

means for processing, by one or more of the software processes other than the data-object replication processes, data-object processing operations, the one or more data objects assigned to the identifier while the identifier is set to the first state;

means for storing, after processing the one or more data objects, the one or more processed data objects to the source memory; ~~of the source-system;~~

means for removing the shared lock from the electronic data element after the one or more processed data objects have been committed to storage in the source memory; ~~of the source system;~~

means for changing, after removing the shared lock from the electronic data element, the state of the identifier to the third state;

means for setting an exclusive lock on the electronic data element after changing the state of the identifier to the third state;

means for replicating, by the one or more data-object replication processes after ~~setting~~ the exclusive lock has been set on the electronic data element, the one or more processed data objects from the source memory ~~in the source-system to a memory in the target memory; system;~~ and

means for removing the exclusive lock from the electronic data element after replicating the one or more processed data objects from the source ~~system-memory~~ memory to the target memory. ~~system.~~

25. (Currently Amended) A computer-readable ~~medium~~memory storing instructions for execution by a processor for performing a method of replicating data objects from a source system to a target system, the method comprising:

~~creating-providing~~ an electronic data element accessible to at least one software program implementing one or more data-object replication processes and one or more software processes other than the one or more data-object replication processes, the electronic data element having a first data field containing data representing an identifier functioning as a link to one or more data objects and a second data field containing data representing a state of the identifier, wherein the state of the identifier is set to one of the following states:

- a) a first state, in which said electronic data element is accessible by one or more of the software processes other than the data-object replication processes ~~data-object processing operations~~ and whereby said identifier is assignable to one or more data objects,
- b) a second state, in which said electronic data element is not accessible by one or more of the software processes other than the data-object replication processes ~~data-object processing operations~~ and whereby said identifier is ~~assignable~~ assigned to one or more data objects, and
- c) a third state, in which said electronic data element is not accessible by one or more of the software processes other

~~than the data-object replication processes data-object-~~
~~processing operations~~ and whereby said identifier is not
assignable to one or more data objects;

setting the state of the identifier to the first state;

setting a shared lock on the electronic data element after the state of the
identifier has been set to the first state;

assigning the identifier to one or more data objects stored in a memory of the
source system;

processing, by one or more of the software processes other than the data-object
replication processes, ~~data-object processing operations~~, the one or more
data objects assigned to the identifier while the identifier is set to the first
state;

storing, after processing the one or more data objects, the one or more
processed data objects to the memory of the source system;

removing the shared lock from the electronic data element after the one or more
processed data objects have been committed to storage in the memory of
the source system;

changing, after removing the shared lock from the electronic data element, the
state of the identifier to the third state;

setting an exclusive lock on the electronic data element after changing the state
of the identifier to the third state;

replicating, by the one or more data-object replication processes after setting the
exclusive lock has been set on the electronic data element, the one or

more processed data objects from the memory in the source system to a
memory in the target system; and
removing the exclusive lock from the electronic data element after replicating the
one or more processed data objects from the source system to the target
system.